WHAT IS CLAIMED IS:

1   1.   A method for billing a VoIP (Voice-over-Internet Protocol) call in a communication

2   system in which, the method comprising the steps of:

3   providing a calling party's VoIP gateway is connected to a called party's VoIP gateway

4   through an IP network, the calling and called party's VoIP gateways each including a VoIP trunk

5   connection processor, an extension subscriber connection processor and a VoIP call processing

6   central controller;

7   determining, in the extension subscriber connection processor of the calling party's VoIP

8   gateway, whether a called party responds to a call from the calling party, and upon receipt of the

9   response, informing the VoIP trunk connection processor of receipt of the response;

10   receiving, in the VoIP trunk connection processor, the response information from the called

11   party at the extension subscriber connection processor, assembling a response packet, and

12   transmitting the assembled response packet to the calling party's VoIP gateway through a VoIP call

13   channel;

14   checking, in the calling party's VoIP gateway, the response packet out of the packets

15   received through the call channel, and transmitting the checked response packet to the VoIP call

16   processing central controller; and

17   recording, in the VoIP call processing central controller, a call start time for the

18   corresponding VoIP call using the response information received from the VoIP trunk connection

19   processor.

1   2.   A VoIP call billing method, the method comprising the steps of:

2   (a) providing a calling party in a communication system in which a calling party's VoIP

3   gateway is connected to a called party's VoIP gateway through an IP network, the calling and called

4   party's VoIP gateways each including a VoIP trunk connection processor, an extension subscriber

5   connection processor and a VoIP call processing central controller;

6   (b) generating a dial tone when a VoIP call processing central controller detects hook-off,

7   and waiting for digits to be input;

8   (c) analyzing the dialed digits corresponding to a phone number of the other party, and

9   attempting to connect a VoIP call to determine whether the call is setup or not;

10   (d) performing VoIP call setup to the other party's VoIP gateway, when the call is setup in

11   step (c);

12   (e) receiving a voice packet from the other party by activating a voice packet channel, after

13   performing the VoIP call setup;

14   (f) converting the received voice packet to a PCM (Pulse Code Modulation) signal for the

15   subscriber and determining whether there exists a consecutive voice packet being received; and

16   (g) determining, when there is no consecutive voice packet, whether a response information

17   packet is received or not, and informing, when the response information packet is received, receipt

18   of the response information packet to the VoIP call processing central controller, setting a call time,

19   and recording billing information.

1   3.   A VoIP call billing method, the method comprising the steps of:

2   (a) providing a called party in a communication system in which a calling party's VoIP

3   gateway is connected to a called party's VoIP gateway through an IP network, the calling and called

4   party's VoIP gateways each including a VoIP trunk connection processor, an extension subscriber

5   connection processor and a VoIP call processing central controller;

6   (b) upon receipt of a VoIP call setup request from the calling party, transmitting a called

7   party's phone number to the VoIP call processing central controller to analyze the called party's

8   phone number;

9   (c) activating a voice packet channel according to the analyzing results to transmit a voice

10 packet, generating a ring tone for the extension subscriber, and determining whether a response is

11 received from the calling party; and

12 (d) upon failure to receive a response, awaiting the response, and upon receipt of a response,

13 informing the VoIP call processing central controller and the VoIP trunk connection processor of

14 receipt of the response, and then transmitting a response information packet for the corresponding

15 call to the calling party's VoIP gateway.

1   4. A method for billing a voice over the internet (VoIP) call, said method comprising the

2   steps of:

3   (a) picking up the handset of the calling party's telephone;

4   (b) detecting an off hook condition in an extension subscriber connection processor of a

5   calling party's gateway;

6   (c) informing a VoIP call processing central controller of the calling party's gateway that the

7   calling party's telephone is off the hook;

8   (d) generating a dial tone for the calling party by said VoIP call processing central controller;

9   (e) inputting digits identifying a called party into said calling party's telephone handset;

10   (f) recognizing said input digits by said VoIP call processing central controller;

11   (g) transmitting the inputted digits from said extension subscriber connection processor to

12   said VoIP call processing central controller;

13   (h) analyzing the input digits to determine an Internet protocol of the called party's gateway;

14   (i) connecting the call between the calling party's gateway and the called party's gateway

15   by having the calling party's VoIP call processing central controller command the VoIP trunk

16   connection processor;

17   (j) activating a packet by the VoIP trunk connection processor of the calling party's gateway;

18   (k) receiving a packet from called party's gateway;

19   (l) converting said packet to pulse controlled modulation signal to generate voice signal for

20   the caller;

21   (m) analyzing said packet by said caller's VoIP trunk connection processor to determine

22   whether it is a response information packet;

23   (n) informing said VoIP call processing central controller by said VoIP trunk connection

24   processor of receipt of the response information packet; and

25   (o) setting a call start time and recording biloing by said VoIP call processing central

26   controller of said calling party's gateway.

1   5. The method of claim 4, where said packet in steps (j) through (m) are voice packets.

1   6. The method of claim 4, wherein said packet in steps (j) through (m) are ring-back tone

2   packets.

1   7. The method of claim 4, wherein said call is originated from a VoIP gateway in the form

2   of a private automatic branch exchange.

3   8. A method for billing a voice over the internet (VoIP) call, said method comprising the

4   steps of:

5   (a) receiving, through a VoIP trunk connection processor of the called party's gateway a call

    setup request from the calling party's gateway;

    (b) transmitting called party's phone number information to a VoIP call processing central

6   controller in said called party's gateway;

7   (c) analyzing the called party's phone number by said VoIP call processing central

8   controller;

9   (d) activating a ring-back tone packet channel to transmit a packet through said ring-back

10   tone packet channel by said VoIP trunk connection processor of the called party's gateway;

11   (e) generating a ring tone for a subscriber on a phone of said called party's gateway via said

12   VoIP call processing central controller and said extension subscriber connection processor of said

13 called party's gateway;

14 (f) picking up the phone off the hook on the called party's telephone;

15 (g) detecting the off-hook condition by said extension subscriber connection processor of

16 said called party's gateway;

17 (h) informing the VoIP call processing central controller of the off-hook condition;

18 (i) informing the VoIP trunk connection processor of the called party's gateway of the off-

19 hook condition;

20 (j) assembling a response information packet by the VoIP trunk connection processor of the

21 called party's gateway; and

22 (k) transmitting said response information packet to a calling party's gateway.

9. The method of claim 8, wherein the packet of step (d) is a voice packet.

10. The method of claim 8, wherein the packet of step (d) is a ring-back tone packet.

1 11. The method of claim 8, wherein said call is originated from a VoIP gateway in the form

2 of a private automatic branch exchange.